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Certified by

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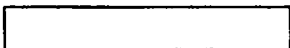
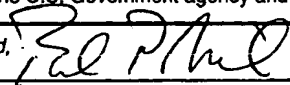Please type a plus sign (+) inside this box ➔ 🔲

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

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INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
CHAD ANDREW	LEFEVRE	INDIANPOLIS, INDIANA
MARK GILMORE	MEARS	ZIONSVILLE, INDIANA
JAMES DUANE	TENBARGE	FISHERS, INDIANA
BRET DAVID	HAWKINS	BROWNSBURG, INDIANA

☐ *Additional inventors are being named on the _____ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

METHOD AND APPARATUS FOR PROVIDING SIMPLIFIED PEER-TO-PEER RECORDING

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☐ Customer Number | Type Customer Number here ➔ | *Place Customer Number Bar Code Label here*

OR

☒	Firm *or* Individual Name	JOSEPH S. TRIPOLI, THOMSON LICENSING INC.
Address		PATENT OPERATIONS.
Address		P. O. BOX 5312

City	PRINCETON	State	NJ	ZIP	08543-5312
Country	USA	Telephone	609-734-6834	Fax	609-734-6888

ENCLOSED APPLICATION PARTS (check all that apply)

☒ Specification *Number of Pages* `4`   ☐ CD(s), Number `____`

☒ Drawing(s) *Number of Sheets* `2`   ☐ Other (specify) `____`

☐ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT (check one)

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees

☒ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: `07-0832`

☐ Payment by credit card. Form PTO-2038 is attached.

FILING FEE AMOUNT ($) `160`

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.
☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____.

Respectfully submitted, [signature]   Date `11/10/03`

SIGNATURE _____

TYPED or PRINTED NAME PAUL P. KIEL

TELEPHONE 609 734-6815

REGISTRATION NO. (*if appropriate*) `40,677`

Docket Number: `PU030295`

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

METHOD AND APPARATUS FOR PROVIDING SIMPLIFIED
PEER-TO-PEER RECORDING

In a system that uses the IEEE-1394 protocol, it is possible for a third party device on the bus to establish and maintain a connection between two other devices on the network. In the present application, this means that, for example, a television, or display device, can create a connection between a 1394 compliant cable box (or satellite box) and a 1394 compliant AVHDD (hard disk drive recorder). We plan to use this ability to establish this type of connection so the user can use the AVHDD (Audio-Video Hard Disk Drive) to simultaneously record and play back content from another 1394 device (that is, not from the TV tuner). The present invention may be implemented in the 1394 compliant devices, for example, using programming techniques known to those skilled in the art.

Users today expect more out of their home entertainment systems. For years, they have been able to record standard analog broadcasts via a VCR. In recent years, hard drive based systems have allowed the user to record a digital copy of an analog broadcast, also allowing the user to play the track back while it is being recorded. Devices that do this are currently only being used to record analog broadcasts, but there is a desire to have the same functionality with digital broadcast. Digital broadcasts lend themselves easily to this sort of functionality, since there is no need to digitize the data. The user can record a perfect copy of what is coming to him over his HD tuner (as long as he records it over a digital medium, such as but not limited to, IEEE-1394). Routing the data from a digital TV tuner over 1394 to a hard disk drive is a challenge in itself, but fits with the current thinking ("I can record my TV tuner onto this device"). The ability to record digital data directly from a cable or satellite box over 1394 to a hard disk drive unit is what the user would ideally want. Incorporating this functionality into the TV and making it behave similar to the normal TV operation is the problem solved by the present invention.

Devices such as TiVo and ReplayTV are known for encoding and recording data onto a hard disk drive. These units also pioneered the concept of a PVR or personal video recorder, which allows the user to "pause live TV." These units let the user

pause, rewind, fast forward, frame advance, and many other functions commonly known as "trick modes" on a TV program that the user is currently watching. They do this by recording the content and playing it back at least slightly delayed from the real content. The delay in playback occurs because recording the content does not occur in true real-time. If the user rewinds or pauses the show, then the playback remains that far behind the current TV show (or live TV). These devices give the user the option to switch back to live TV whenever the user desires, but the concept of "live TV" now means one or two seconds delayed due to the constant recording that is being done in the background.

Certain HDTVs, such as the DM2CR based products manufactured by Thomson, allow the user to connect an external AVHDD (Audio-Video Hard Disk Drive) via 1394, and which the user can use to gain PVR-type functionality. This is not a PVR in the sense described above, since the user has to initiate any recordings to PVR on (i.e., the AVHDD is not continuously recording all content). The user also has the ability to stop the recording at any time. Known PVRs set a limit in the amount of data that can be buffered at once, overwriting the oldest data in the track (The RCA DRS7000N allows the user to buffer approximately 45 minutes of data – once data is older than 45 minutes, it is overwritten with new data and lost). The DM2CR based HDTVs only allowed the user to record digital content from the TV's digital tuner.

The Mitsubishi line of HDTVs allowed for the recording of one 1394 device to another, but did not allow the user to operate this as a PVR. The user would set up timed recordings in a menu, and the TV would initiate and end the recordings in the background.

The present invention allows the user to continuously record onto his AVHDD, whether from the TVs digital tuner or from another 1394 device. This connection is always recording, as in the case of TiVo or the like, but the invention allows the user to record from any selected digital MPEG2 source (the TV tuner or another 1394 device).

In Thomson's DM2CR based products, we implemented a feature that allowed the user to record to a hard disk drive unit over the 1394 bus. The user was required to initiate this by pressing the RECORD key on the remote, and was required to STOP

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the recording by pressing the STOP key on the remote. This type of recording would save all of the data from the point that the user hit RECORD to the point that the user hit stop. Only digital data was allowed to be recorded from the TV tuner since the TV does not have an MPEG encoder.

While we are keeping with this functionality in the DM3 based products, the present invention also extends it so the user can continuously record to the hard disk drive unit in a predefined block size. What this means is that if the user has the "PVR" feature turned on in the menu, we will buffer digital data to the hard disk drive in a "loop" fashion. Whenever the user is tuned to a digital channel on the TV tuner, we will be recording this data in the background. Once the data has filled the predefined buffer size, it will begin to overwrite the previous data in the buffer, thus making the recording a loop.

Another addition to the previous functionality is the ability to perform this same kind of operation from a recordable 1394 device (that is, a 1394 device which is "output only" and cannot make its own recordings). If the user is tuned to a recordable 1394 device (for example, a 1394 cable box), we will stop buffering data from the TV tuner, and we will start buffering data from the 1394 device. This is achieved through what is commonly known as a peer-to-peer connection. The TV will initiate a connection directly between the recordable 1394 device (e.g. the cable box) and the 1394 recorder (e.g. the hard disk drive unit [AVHDD]). The TV will not participate in the data exchange between the two devices, but will still be able to control each of the devices (e.g. issuing channel changes on the cable box and stopping/starting the recording on the hard disk drive unit).

In our system, this presented some difficulties beyond that which is inherent from creating and managing these types of connections. With previous product, the user could use the INPUT key on the remote to switch inputs until they were watching the hard disk drive unit, from which they could watch the playback of the current recording. In this product, the same way of input switching could have undesired effects, as there may be a recordable 1394 device in the input list between the tuner and the 1394 recorder. We chose to change the device that was being recorded to be

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the last device that was being watched, so it meant that if the user switched inputs from the tuner to the 1394 cable box, we would start recording the 1394 cable box on the hard disk drive unit. If the user then switched inputs to the hard disk drive unit, the playback from the hard disk drive unit would be the buffered data from the 1394 cable box.

In the case where the user wanted to watch the buffered data from the TV tuner and input cycling would have caused the PVR source to become the 1394 cable box, there are other ways for the user to switch to the PVR device (the hard disk drive). The user could have an autotune set up so the VCR1 key could switch the user directly to the input, or the user can use any of the transport/PVR keys and they will switch to the PVR device and perform their required operation (PAUSE, FF, REWIND, COMMERCIAL SKIP, INSTANT REPLAY, etc.). This way, the user gets the most functionality out of the TV without having to go through menus to set everything up every time he wants to PVR on a different source.

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1394 Cable Box / Satellite Box as "TV tuner"

| 1394 Cable Box / 1394 Satellite Box | ——Peer-to-peer——→ | AVHDD |

—IEC-61883—

·········EIA-931-A·········

DM3

1394 Cable Box / Satellite Box in PVR-mode

| 1394 Cable Box / 1394 Satellite Box | ——Peer-to-peer——→ | AVHDD |

—IEC-61883—

DM3

1394 Cable Box / Satellite Box in PVR-mode as "TV tuner"

| 1394 Cable Box / 1394 Satellite Box | ——Peer-to-peer——→ | AVHDD |

·········EIA-931-A·········

—IEC-61883—

DM3

Fig. 1

Record the
tuner to the
PVR device
& watch
tuner

User presses
INPUT

Is there a LINE
INPUT to go to? ——YES

NO

Is there a 1394
device to go to?

NO

YES

Is this a 1394
device
that can be
recorded? ————————YES

NO

Is the 1394
device the PVR
device? ——YES

NO

Record the 1394
device to the
PVR device &
watch the 1394
device

Watch the
playback of
the 1394
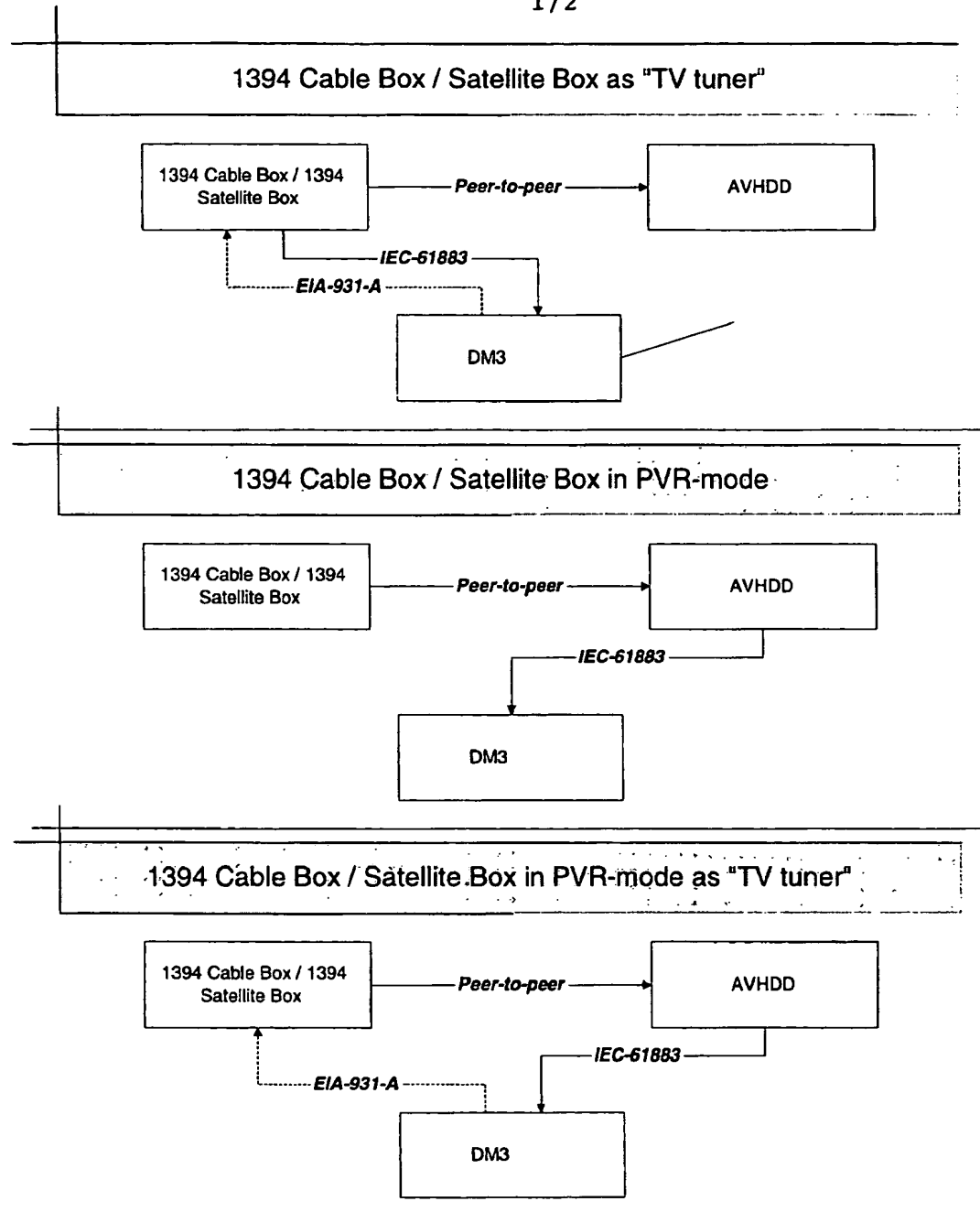device

Watch the
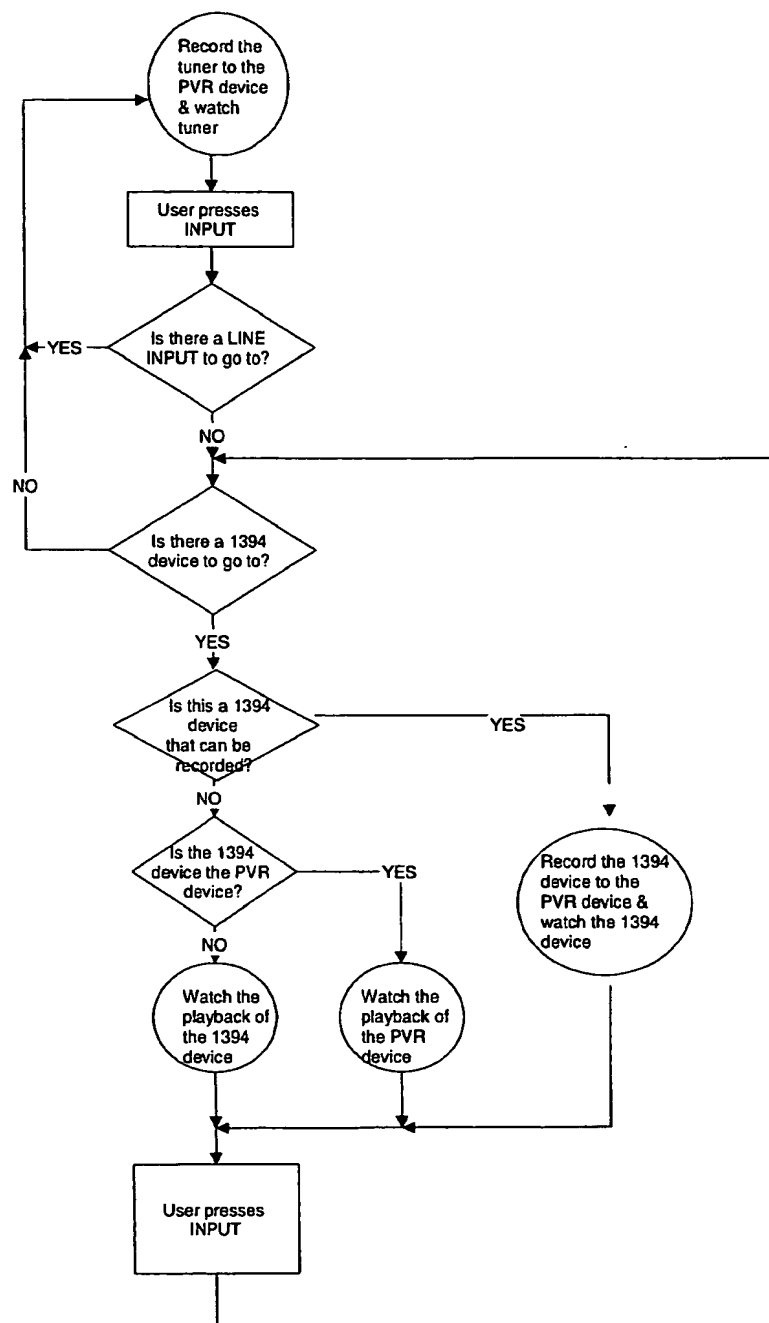playback of
the PVR
device

User presses
INPUT

Fig. 2

Document made available under the Patent Cooperation Treaty (PCT)

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